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Military and Civilian Lifetime Earnings Comparisons

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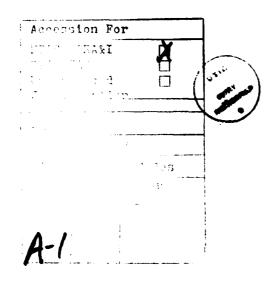Tehnical review by

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The President's Fifth Quadrennial Review of Military Compensation (QRMC) has been directed to study military compensation issues with particular attention paid to military retirement. This report was prepared for the Director of Human Resources Development in the Army's Office of the Deputy Chief of Staff for Personnel, in support of the Fifth QRMC.

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Abstract (Continued)

There is considerable interest in the question whether military personnel are comparably paid relative to their civilian counterparts. Life-cycle earnings comparisons are made here for several categories of Army personnel and civilians. The results show that as of the end of Fiscal Year 1982, many Army personnel are underpaid relative to civilians, especially in highly technical occupations. The results hold even when the analysis includes military housing allowances, PX and commissary privileges, and tax advantages.

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Military and Civilian Lifetime Earnings Comparisons

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The Manpower and Personnel Policy Research Group of the Army Research Institute (ARI) performs research in the economics of manpower, personnel and training issues of particular significance to the U.S. Army. Recently questions about the appropriate levels of military compensation have generated considerable interest.

The President's Fifth Quadrennial Review of Military Compensation (QRMC) has been directed to study military compensation issues with particular attention paid to military retirement. This report was prepared for the Director of Human Resources Development in the Army's Office of the Deputy Chief of Staff for Personnel, in support of the Fifth QRMC. The authors compare lifetime earnings for several categories of Army personnel and civilians.

The ideas developed in this report help quantify many of the important income components of civilian and military personnel, and contribute to the discussion of the appropriate level of compensation.

EDGAR M. JOHNSON
Technical Director

EXECUTIVE SUMMARY

Requirement:

The U.S. Army Research Institute conducts research on manpower, personnel, and training issues of particular significance and interest to the U.S. Army. Recently, the President's Fifth Quadrennial Review of Military Compensation (QRMC) has been directed to study military compensation issues, with particular emphasis on special incentive pays and military retirement. This research was conducted in support of the Fifth QRMC. Lifetime earnings comparisons are made here for several categories of Army personnel and civilians.

Procedure:

The authors use government and private wage surveys to compare earnings of Army officers and their civilian counterparts. Since combat arms specialities have no civilian counterpart, the assumption is made that upon retirement the soldier will find a civilian job in his alternate speciality. Allowances are made for PX and commissary privileges, and tax advantages. Civilians are assumed to have bonuses, savings, and/or thrift plans.

Findings:

Comparisons of lifetime earnings of Army personnel and their civilian counterparts show that military personnel may earn substantially less over their lifetime than their civilian peers. The key to this research is that occupational categories must be matched as closely as possible.

Utilization of Findings:

The proper level of military compensation is a force management issue that requires a considerable amount of subjective military judgement. There is no way to quantify the so called 'X factor,' a term that refers to the differential risks, peculiarities, and hardships associated with employment in military service. Nevertheless, questions frequently arise as to how well-paid military personnel are relative to civilians. This research contributes to the discussion by quantifying many of the important income components.

MILITARY AND CIVILIAN LIFETIME EARNINGS COMPARISONS

PART I - OFFICER COMPARISONS

Life-Cycle Earnings Comparisons of Military and Civilian Occupations

Charles Dale, U.S. Army Research Institute

PART II - ENLISTED PERSONNEL AND WARRANT OFFICER COMPARISONS

Military and Civilian Lifetime Earnings

Lawrence G. Hill, Argonne National Laboratory

PART I

OFFICER COMPARISONS

LIFE-CYCLE EARNINGS COMPARISONS OF
MILITARY AND CIVILIAN OCCUPATIONS

by

Charles Dale

ABSTRACT

The President's Fifth Quadrennial Review of Military Compensation (QRMC) is currently studying the issues of military compensation with particular emphasis on special incentive pays and military retirement. This research, comparing military and civilian lifetime earnings, was conducted for the Director of Human Resources Development in the Army's Office of the Deputy Chief of Staff for Personnel, in support of the Fifth QRMC.

There is considerable interest in the question of whether military personnel are comparably paid relative to their civilian counterparts. Lifetime earnings comparisons are made here for several categories of Army officers and civilians. The results show that as of the end of Fiscal Year 1982, many Army officers are underpaid relative to civilians, especially in highly technical occupations. The results hold even when the analysis includes military housing allowances, PX and commissary privileges, and tax advantages.

I. INTRODUCTION

Every four years, the President directs the Department of Defense to examine particular issues in military compensation. This year, the Fifth Quadrennial Review of Military Compensation (QRMC) is specifically studying special incentive pays and the military retirement system. This research, comparing military and civilian lifetime earnings, was conducted for the Director of Human Resources Development in the Office of the Army's Deputy Chief of Staff for Personnel, in support of the Fifth QRMC.

There have been a number of studies of military compensation issues in recent years,[1] many of which mention serious measurement and data problems. One difficult issue is whether military personnel receive pay comparable to civilians in similar jobs.

A study by Cooper (1977) concluded that officers receive considerably higher lifetime earnings than civilians, but that enlisted personnel receive comparable earnings. Cooper's study, however, compared military earnings only to national averages, to make very approximate comparisons. The present work follows a method developed by Hill (1983), in which typical military and civilian lifetime earnings streams are compared using survey data from individual professions.

In this study, we compare military and civilian lifetime earnings for four types of officers: Infantry Officers with secondary specialities as Engineers, Infantry Officers/Public Affairs Officers, Armor Officers/Comptrollers, and Artillery Officers/Operations Research-Systems Analysts. Our work shows that many officers,

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[1]See, for example, Brunnhoeffer and Gilbert (1977), Chipman (1979), Chipman and Mumm (1978, 1979), Cooper (1977), Doering and Hutzler (1982), Fechter (1977), Goldberg and Warner (1983), Goldich (1980), Hill (1983), Kramer (1968), Mahoney and MacRae (1967), Patten (1983), Rivlin (1983), Smoker, Johnson, and Doering (1983), Talbot (1976), General Accounting Office (1978), and Warner (1979). For a general discussion of calculating lifetime earnings, see BLS (1982c, 1983) and Bureau of the Census (1983).

especially in highly technical fields, receive substantially lower lifetime earnings than their civilian counterparts.

We draw no conclusions here about the issue of whether military personnel are paid "fairly." The level of military compensation is a force management issue that requires a considerable amount of subjective military judgment. Nevertheless, questions frequently arise as to how well-paid military personnel are relative to civilians. This article contributes to the discussion by quantifying many of the important income components. Whether the calculated amounts are "fair" or should be changed are policy questions which we do not address.

IL THE OCCUPATIONAL COMPARISONS

There are very few jobs for which exact military and civilian occupational comparisons can be made. We, therefore, will use the fact that military officers have dual specialities,[2] and assume that they will eventually find civilian employment in their alternate specialty. Examples were extracted from actual skill specialty information.

For example, an Infantry Officer (Primary Code 11) might spend several years in the field with troops, and then spend the next several years as a staff person in his alternate specialty, say Engineer (Primary Code 21). Some career fields, such as Comptroller (Code 45), Public Affairs Officer (Code 46), and Operations Research/Systems Analysis (ORSA) Officer (Code 49), can only be entered as alternate specialities, after training and experience as a combat arms officer. Examples of other permissible primary specialities are Armor Officer (Code 12), and Artillery Officer (Code

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[2]For a discussion of the details of the dual specialty system see Sabine and Russell (1981), Hanne (1982), and Arter and Goldsmith (1983).

13).

The key assumptions for military officers are listed in Table 1. Officers are assumed to be promoted at the average times, and to retire at 20 or 22 years as a Lieutenant Colonel, or at 26 years as a Colonel. Retirement pay is computed on the basis of the last year's active duty basic pay.[3]

For the purposes of this analysis, military pay while on active duty is Basic Military Compensation -- basic pay, basic allowances for quarters and subsistence and the federal tax advantages on the tax-free allowances.

A cash value is imputed for post exchange (PX) and commissary expenditure savings. Army personnel are assumed to spend 24.5 percent of their total budget for food, which is the national average[4] (see BLS Handbook of Labor Statistics, 1980), and that 40 percent of these expenditures are assumed to be made at the commissary and exchange. The total PX and commissary savings are equal to the total of those expenditures times 23 cents, which is the Army estimate of average cost savings per dollar spent (see Office of the Comptroller of the Army, 1982).

Because health benefits are not as easily quantifiable as commissary and exchange privileges, and plans vary widely in the private sector (see BLS 1982a, and Chamber of Commerce 1982), this analysis assumes that military and private health plans are comparable, and does not impute a dollar amount to them.

Another nonquantifiable consideration is the so called 'X-factor,' a term that

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[3]Those entering the service after September 7, 1980 will have their retirement pay based on the average basic pay of their last 36 months of active service. The method of computation used in this article applies to most officers now in the service. Switching to the new method of computation would lower the projected lifetime Army earnings.

[4]Very recent surveys by the Bureau of Labor Statistics will show that expenditures for food and beverages as a percent of income are declining, down to about 20.7 percent in 1982. Use of this smaller percentage would lower our estimated lifetime Army earnings.

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TABLE 1

SUMMARY OF ARMY ASSUMPTIONS ON WORK-LIFE HISTORY

- A 22 year old enters the Army as an O-1.

- The officer stays in the Army and is promoted at the average times.

- Pay is Basic Military Compensation, which is basic pay, basic allowances for quarters and subsistence and the federal tax advantage on the tax-free allowances.

- The officer retires after 20 or 22 years as a Lieutenant Colonel, or after 26 years as a Colonel.

- The officer retires at 50 percent, 55 percent, or 65 percent of his basic pay of his last month in the Army, and dies the day before his 74th birthday. His Army retirement pay increases 6 percent per year, on the assumption that consumer price increases, the basis for retirement pay adjustments, will grow at that rate.

- Health benefits received are comparable to those of his civilian counterpart, so no dollar amount is imputed for them.

- PX and commissary expenditure savings are calculated by assuming food purchases are 24.5 percent of the total budget, and 40 percent of that amount is purchased at commissaries and exchanges. This amount is multiplied by 23 cents, which is the estimated cost saving per dollar.

- Upon retirement the officer is able to find a civilian job in his alternate specialty.

- At age 65 the retiree begins to receive the monthly average social security payment.

refers to the differential risks, peculiarities, and hardships associated with employment in military service. No attempt is made to impute a dollar value to the "X-factor", although if it could be done, estimates of military earnings would be reduced even further.

The officer is assumed to be able to find a civilian job upon retirement at a salary level comparable to the total number of years of experience in his alternate specialty. Thus, prospective employers are assumed to ignore the fact that the officers may have had several three- or four-year tours working in their primary specialty,[5] i.e., the ORSA officer may work three or four years in a field artillery batallion, or other field artillery-related status.

The officer is assumed to receive the average monthly social security payment when he retires at age 65. The same assumption is made for civilian employees, so social security payments do not create a differential.

The key civilian assumptions are listed in Table 2. The civilian is assumed to have a bonus, savings and/or thrift plan equal to 1.3 percent of his annual salary (from Handbook of Labor Statistics 1980). He retires at age 65 and receives social security payments, and a private pension equal to 37 percent of his last working year's salary (see President's Commission on Pension Policy 1981). He and his military counterpart both die the day before their 74th birthday, the national average (from Public Health Survey 1977).

Individual occupational categories were matched by using survey data. Engineers'

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[5] Breaks in time in a given career area are not the only problem the officer faces. Frequently, the complexity of his tasks do not increase as rapidly as those of his private sector counterpart, so instead of having, say, twelve years experience, he has three beginning years experience four times. Studies of Operations Research/Systems Analysis personnel in the Army (see Obert 1978) and Marine Corps (Thomas and Mitchell 1983) show that most of their jobs do not in fact increase in technical complexity over time. This may make it more difficult to find private sector jobs in their areas of specialty.

TABLE 2

SUMMARY OF CIVILIAN ASSUMPTIONS

- The employee starts his career at age 22, and is promoted at the same times as his Army counterpart. He retires at age 65 and receives the average monthly social security payment. He dies the day before his 74th birthday.

- Pay scales are calculated using government and private wage surveys.

- The employee has bonuses, savings and/or thrift plans equal to 1.3 percent of his annual salary.

- Health benefits received are comparable to those of his Army counterpart, so no dollar amount is imputed to them.

- The employee receives a private pension equal to 37 percent of his last working year's pay. The private pension is not indexed for inflation.

and Comptrollers'[6] salaries were taken from the National Survey of Professional, Administrative, Technical, and Clerical Pay (BLS 1982b). Operations Research/Systems Analyst Data are from Auslander (1982) and McCallum and Bodin (1982). Public Affairs Officers' salaries are taken from Jackson (1982).

Yearly pay increases used were the average of the period 1970 to 1982. ORSA employees' salaries were grown at the engineers' average of 7.6 percent, public affairs officers' salaries were grown at the personnel directors' rate of 8.3 percent, and comptrollers' salaries were grown at the chief accountants' average of 8.3 percent. Earnings streams were discounted at a 10 percent rate, which is not only close to the current interest rate on long-term government bonds, but is the standard rate used to measure the present value of many government projects (see Gramlich 1981).

III. RESULTS

The comparisons of earnings of military and civilian personnel are shown in Tables 3 through 10, and the results are summarized in Table 11. About one third of all Army officers receive a variable housing allowance (VHA) in a given year, so a range of results was calculated. At one extreme the officers were assumed to receive no VHA during their entire career. At the other extreme they were assumed to receive an amount equal to the Washington, D.C. VHA, which is one of the highest payments in the country, for every year they were in service. The results shown in Table 11 use the midpoint of those

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[6] The comparison of civilian chief accountants and Army comptrollers is the most inexact match in this work, since comptrollers in the Army are actually resource managers, typically with broad responsibility in nonaccounting areas of financial management. Including these additional responsibilities in the civilian income stream would greatly increase the civilian person's lifetime pay. The Army officer would fall substantially further behind during his military career, and only recover at a slightly faster rate than computed above, due to a higher civilian salary upon his retirement.

two extremes.

The results clearly show the importance of the military retirement contribution to the officers' lifetime earnings stream. Table 3 shows that at Army retirement the Infantry Officer/Engineer has earned from $119,000 to $173,000 less than his civilian counterpart, which is from 17 percent to 30 percent less in total earnings. At death, however, the Army officer has narrowed the gap considerably, as shown in Table 4. Depending upon his choice of retirement time, the Army officer will have earned only 1 to 7 percent less than his civilian counterpart. Military retirement benefits clearly operate to reduce substantially the military/civilian lifetime earnings differential.

Similar results hold for the other occupations. At Army retirement the Infantry Officer/Public Affairs Officer has earned from 3 percent less to 5 percent more than his civilian counterpart (Table 5), while at death he has earned from 1 percent to 10 percent more (Table 6). The Armor Officer/Comptroller has earned from 2 to 9 percent less than his civilian counterpart when he retires (Table 7) but is only 1 percent behind to 7 percent ahead at death (Table 8). Finally, the Artillery Officer/ORSA Officer is 17 percent to 28 percent behind his civilian counterpart at Army retirement (Table 9), but only 2 to 9 percent behind at death (Table 10).

We emphasize that we have used very conservative assumptions in our analysis so that most changes in our assumptions would lower the estimated relative earnings of Army officers. For example, if the officer does not make full use of his imputed PX and commissary privileges, this will lower his lifetime earnings. For those who entered the service after September 7, 1980, their retirement benefits will be calculated on their final 36 months of service, rather than their last year, which will lower their income. Finally, there is no way to measure the 'X-factor,' which is that Army officers will frequently have to work longer hours, make more frequent residence changes, and take considerably more personal risks than civilians. If any of these factors could be easily

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TABLE 3

TOTAL EARNINGS OF INFANTRY OFFICER/ENGINEER VERSUS CIVILIAN ENGINEER

PRESENT VALUE IN THOUSANDS OF 1982 DOLLARS

AT ARMY RETIREMENT

YEARS IN SERVICE	ARMY PAY	CIVILIAN PAY IN POST-ARMY YEARS	TOTAL CIVILIAN/ARMY PAY	CIVILIAN PERSON'S PAY	DIFFERENCE (ARMY-CIVILIAN)	PERCENT DIFFERENCE (DIFFERENCE ÷ ARMY PAY)
20	$520 to $556	0	$520 to $556	$675	-$119 to -$155	-21 to -30
22	$576 to $614	0	$576 to $614	$741	-$127 to -$165	-21 to -29
26	$699 to $743	0	$699 to $743	$872	-$129 to -$173	-17 to -25

Army pay range represents $0 VHA to full Washington, D.C. VHA.

A minus sign means the Army is behind.

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TABLE 4

TOTAL EARNINGS OF INFANTRY OFFICER/ENGINEER VERSUS CIVILIAN ENGINEER

AT DEATH

PRESENT VALUE IN THOUSANDS OF 1982 DOLLARS

YEARS IN SERVICE	ARMY PAY	CIVILIAN PAY IN POST-ARMY YEARS	TOTAL CIVILIAN/ ARMY PAY	CIVILIAN PERSON'S PAY	DIFFERENCE (ARMY-CIVILIAN)	PERCENT DIFFERENCE (DIFFERENCE ÷ ARMY PAY)
20	$696 to $732	$617	$1313 to $1349	$1398	-$49 to -$85	-4 to -6
22	$756 to $794	$545	$1301 to $1339	$1398	-$59 to -$97	-4 to -7
26	$906 to $950	$435	$1341 to $1385	$1398	-$13 to -$57	-1 to -4

Army pay range represents $0 VHA to full Washington, D.C. VHA.

A minus sign means the Army is behind.

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TABLE 5

TOTAL EARNINGS OF INFANTRY OFFICER/PUBLIC AFFAIRS OFFICER VERSUS CIVILIAN PUBLIC AFFAIRS OFFICER

AT ARMY RETIREMENT

PRESENT VALUE IN THOUSANDS OF 1982 DOLLARS

YEARS IN SERVICE	ARMY PAY	CIVILIAN PAY IN POST-ARMY YEARS	TOTAL CIVILIAN/ARMY PAY	CIVILIAN PERSON'S PAY	DIFFERENCE (ARMY-CIVILIAN)	PERCENT DIFFERENCE (DIFFERENCE : ARMY PAY)
20	$520 to $556	0	$520 to $556	$536	-$16 to +$20	-3 to +4
22	$576 to $614	0	$576 to $614	$594	-$18 to +$20	-3 to +3
26	$699 to $743	0	$699 to $743	$709	-$10 to +$34	-1 to +5

Army pay range represents $0 VHA to full Washington, D.C. VHA.

A minus sign means the Army is behind.

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TABLE 6

TOTAL EARNINGS OF INFANTRY OFFICER/PUBLIC AFFAIRS OFFICER VERSUS CIVILIAN PUBLIC AFFAIRS

AT DEATH

PRESENT VALUE IN THOUSANDS OF 1982 DOLLARS

YEARS IN SERVICE	ARMY PAY	CIVILIAN PAY IN POST-ARMY YEARS	TOTAL CIVILIAN/ ARMY PAY	CIVILIAN PERSON'S PAY	DIFFERENCE (ARMY-CIVILIAN)	PERCENT DIFFERENCE (DIFFERENCE ÷ ARMY PAY)
20	$696 to $732	$557	$1253 to $1289	$1239	+$14 to +$50	+1 to +4
22	$756 to $794	$515	$1271 to $1309	$1239	+$32 to +$70	+3 to +5
26	$906 to $950	$422	$1328 to $1372	$1239	+$89 to +$133	+7 to +10

Army pay range represents $0 VHA to full Washington, D.C. VHA.

A minus sign means the Army is behind.

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TABLE 7

TOTAL EARNINGS OF ARMOR OFFICER/COMPTROLLER VERSUS CIVILIAN COMPTROLLER

<u>AT ARMY RETIREMENT</u>

PRESENT VALUE IN THOUSANDS OF 1982 DOLLARS

YEARS IN SERVICE	ARMY PAY	CIVILIAN PAY IN POST-ARMY YEARS	TOTAL CIVILIAN/ARMY PAY	CIVILIAN PERSON'S PAY	DIFFERENCE (ARMY-CIVILIAN)	PERCENT DIFFERENCE (DIFFERENCE : ARMY PAY)
20	$520 to $556	0	$520 to $556	$565	-$9 to -$45	-2 to -9
22	$576 to $614	0	$576 to $614	$626	-$12 to -$50	-2 to -9
26	$699 to $743	0	$699 to $743	$755	-$12 to -$56	-2 to -8

Army pay range represents $0 VHA to full Washington, D.C. VHA.

A minus sign means the Army is behind.

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TABLE 8

TOTAL EARNINGS OF ARMOR OFFICER/COMPTROLLER VERSUS CIVILIAN COMPTROLLER

AT DEATH

PRESENT VALUE IN THOUSANDS OF 1982 DOLLARS

YEARS IN SERVICE	ARMY PAY	CIVILIAN PAY IN POST-ARMY YEARS	TOTAL CIVILIAN/ ARMY PAY	CIVILIAN PERSON'S PAY	DIFFERENCE (ARMY-CIVILIAN)	PERCENT DIFFERENCE (DIFFERENCE ÷ ARMY PAY)
20	$696 to $732	$581	$1277 to $1313	$1290	-$13 to +$23	-1 to +2
22	$756 to $794	$533	$1289 to $1327	$1290	-$1 to +$37	0 to +3
26	$906 to $950	$431	$1337 to $1381	$1290	+$47 to +$91	+4 to +7

Army pay range represents $0 VHA to full Washington, D.C. VHA.

A minus sign means the Army is behind.

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TABLE 9

TOTAL EARNINGS OF ARTILLERY OFFICER/ORSA OFFICER VERSUS CIVILIAN OPERATIONS RESEARCH ANALYST

AT ARMY RETIREMENT

PRESENT VALUE IN THOUSANDS OF 1982 DOLLARS

YEARS IN SERVICE	ARMY PAY	CIVILIAN PAY IN POST-ARMY YEARS	TOTAL CIVILIAN/ ARMY PAY	CIVILIAN PERSON'S PAY	DIFFERENCE (ARMY-CIVILIAN)	PERCENT DIFFERENCE (DIFFERENCE ÷ ARMY PAY)
20	$520 to $556	0	$520 to $556	$668	-$112 to -$148	-20 to -28
22	$576 to $614	0	$574 to $614	$734	-$120 to -$160	-20 to -28
26	$699 to $743	0	$699 to $743	$866	-$123 to -$167	-17 to -24

Army pay range represents $0 VHA to full Washington, D.C. VHA.

A minus sign means the Army is behind.

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TABLE 10

TOTAL EARNINGS OF ARTILLERY OFFICER/ORSA OFFICER VERSUS CIVILIAN OPERATIONS RESEARCH ANALYST

PRESENT VALUE IN THOUSANDS OF 1982 DOLLARS

AT DEATH

YEARS IN SERVICE	ARMY PAY	CIVILIAN PAY IN POST-ARMY YEARS	TOTAL CIVILIAN/ ARMY PAY	CIVILIAN PERSON'S PAY	DIFFERENCE (ARMY-CIVILIAN)	PERCENT DIFFERENCE (DIFFERENCE ÷ ARMY PAY)
20	$696 to $732	$589	$1285 to $1321	$1406	-$85 to -$121	-6 to -9
22	$756 to $794	$538	$1294 to $1332	$1406	-$74 to -$112	-6 to -9
26	$906 to $950	$431	$1337 to $1381	$1406	-$25 to -$69	-2 to -5

Army pay range represents $0 VHA to full Washington, D.C. VHA.

A minus sign means the Army is behind.

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TABLE 11

SUMMARY OF LIFETIME INCOME STREAMS

MILITARY VERSUS CIVILIAN CAREERS

		PERCENT DIFFERENCE					
		AT ARMY RETIREMENT			AT DEATH		
SPECIALTY	TITLE	20 YR	22 YR	26 YR	20 YR	22 YR	26 YR
11/21	Infantry Officer/ Engineer	-25.5	-25.0	-21.0	-5.0	-5.5	-2.5
11/46	Infantry Officer/ Public Affairs Officer	+0.5	0	+2.0	+2.5	+4.0	+8.5
12/45	Armor Officer/ Comptroller	-5.5	-5.5	-5.0	+0.5	+1.5	+5.5
13/49	Artillery Officer/ ORSA Officer	-24.0	-24.0	-20.5	-7.5	-7.5	-3.5

A minus sign means the Army is behind.

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quantified, they would surely lower the officers' estimated earnings, and exacerbate the military/civilian earnings differential.

IV. CONCLUSIONS

Comparisons of lifetime earnings of Army officers and their civilian counterparts show that military personnel may earn substantially less over their lifetime than their civilian counterparts. The key to this research, however, is that occupational categories must be matched as closely as possible. Previous research (Cooper (1977)) has only compared average military incomes with national averages of civilian incomes, a comparison which makes Army officers appear to be better paid than civilians. A more meaningful comparison (Table 11) of occupational specialities shows that military personnel can have substantially lower lifetime earnings than their civilian counterparts.[7]

The exact implications of the present work for the Army depend upon personal discount rates, since the higher the discount rate, the more emphasis an individual places on current compensation.[8] It is very difficult to measure personal discount rates (see, for example, Black (1983), Cylke, et. al. (1983), and Hogan (1983)), but most researchers agree that younger personnel place a higher value on near-term earnings than do older individuals. This means that cuts in military pay relative to civilian pay could cause problems for officer recruiting programs,[9] while cuts in retirement benefits could cause problems by lowering the retention rates of experienced personnel.

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[7] Hill (1983) reached similar conclusions for warrant officers and enlisted men.

[8] Recent studies of military enlistment and reenlistment rates have shown that the career decisions of enlisted personnel depend strongly on the level of compensation (Baldwin (1982); Dale and Gilroy (1983a, b, 1984); Daula, et.al. (1983)).

[9] Cuts in current pay are, of course, also a cut in future retirement benefits, which are computed as a function of basic pay.

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PART II

ENLISTED PERSONNEL AND WARRANT

OFFICER COMPARISONS

MILITARY AND CIVILIAN LIFETIME EARNINGS

by

Lawrence G. Hill

ABSTRACT

This research evaluates and compares the lifetime present value income streams of Army enlisted and warrant officer personnel. Twenty selected Military Occupational Specialties are evaluated, from the highly skilled computer technician to the infantryman. More highly skilled personnel with jobs in civilian demand generally fall behind their civilian counterparts by the greatest amount. Results indicate that military retirement is the key element in bringing monetary equality to Army personnel. Army income streams are generally 20 to 30 percent less than those of equivalent civilian careers at military retirement age, but at death the difference is reduced to between 5 and 10 percent. Intangible factors such as moving inconveniences, loss of services to families when military personnel are away from their families, and other such costs are not included in the study. A relaxation of these conservative assumptions would exacerbrate the military-civilian earnings differential. The body of this study assumes a 10 percent discount rate, the mean of the 20 year average of annual long-term U.S. Government bond interest rates (7 percent) and the highest yearly average rate for long-term government bonds (13 percent in 1982). The Appendix provides data for a 7, 10, and 13 percent discount rate comparison.

I. INTRODUCTION

Since 1948 the United States Government has conducted thirteen major reviews of military compensation, and is presently undertaking the fifth Quadrennial Review of Military Compensation (5th QRMC). One objective of this review is to evaluate the military compensation system -- particularly retirement -- in terms of its capability to attract and retain needed personnel. This research is conducted for and funded by the U.S. Army Research Institute in support of the Office of the Deputy Chief of Staff For Personnel and the 5th QRMC. The present values of income streams of selected enlisted and warrant officer personnel (pre- and post-retirement) are compared with those of equivalent civilian workers. The career paths chosen for comparison represent a cross section of skill levels (computer repair technician to infantryman). Comparisons assume military retirement at 20, 22, or 26 years of service.

II. METHODOLOGY

Economists are called upon to testify in courts of law where persons have incurred wrongful personal injury or death. Generally the economist develops a person's 'income earnings projection' (income stream) of future compensation and discounts the stream back to its present value. The long-term U.S. Government bond rate (a perfectly riskless investment) is generally used as the discount factor. The above methodology has been adopted for this study, where lifetime present value income streams for Army personnel who enter civilian employment (referred to as Army/civilian) after military retirement are compared with selected civilian careers. General assumptions and details of the methodology follow.

GENERAL ARMY CAREER COMPENSATION ASSUMPTIONS

This analysis includes only income that a person receives directly in cash or indirectly as a monetary saving. This income includes cash, commissary and exchange savings, social security, and tax savings. The study does not include the "indirect service benefits income," that is, the value of services performed for the household by the person (fixing the family car, housecleaning, home repair, etc.). Excluding the indirect service benefits income is a conservative assumption from a military view, since military personnel are subject to frequent moves, extended periods away from the family, and other conditions that limit these benefits. The analysis also does not include variable housing allowances for duty stations, since these benefits are for selected areas that have higher standards of living and generally have civilian hourly compensation greater than the national average. It is assumed that the increased compensation to the private sector in these areas affects the military variable housing allowance. Including variable housing allowance compensation would change the focus of this research from a national generic comparison to a costly and time-consuming regional and local study.

This analysis assumes that an individual begins an Army career at age 19 and retires after 20, 22, or 26 years of service. The warrant officer retires at a W4 rank. The enlisted person who retires after 20 or 22 years is assumed to be at the rank of E7. The enlisted person who retires after 26 years of service is assumed to be at the E9 level. Both enlisted and warrant officer personnel are assumed to progress in rank at the Army average rate. The warrant officer is assumed to be in the enlisted force to the rank of E6 and becomes a warrant officer after 8.3 years of service.

Army personnel are assumed to receive a 7 percent increase in pay each year after enlistment up to military retirement. This increase is equivalent to the average 1970 to 1980 increases received by professional, administrative, technical, and clerical workers [1].

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Army personnel are also assumed to receive monetary compensation for commissary and exchange expenditures. This benefit is calculated by assuming that Army personnel spend 24.5 percent of their total budget for food, which is equal to the national average [2], and that 40 percent of these expenditures are made at the commissary and exchange. The total commissary and exchange expenditures are then multiplied by 23 cents (the average Army estimate of cost savings per dollar spent [3]).

Selective reenlistment bonus compensation is applied to Military Occupational Specialty (MOS) classes which received this type of compensation on May 20, 1983. Army average bonus compensation is used for zones A thru C. Bonus compensation is assumed to be distributed as a 50 percent lump sum cash benefit in the first bonus year and 10 percent for each of the next 5 years [4].

Social security compensation is assumed to equal national average compensation [5] and increases at 6 percent per year. Since both civilian and military personnel receive this benefit equally, it does not create a differential.

Army personnel retiring at 20 years of service are assumed to retire at 50 percent of their current monthly base pay. Retirement pay increases to 55 percent at 22 years and 65 percent at 26 years. Retirement pay also increases by 6 percent per year to account for inflationary adjustments.

GENERAL ARMY RETIREE CIVILIAN COMPENSATION ASSUMPTIONS

For warrant officers and enlisted personnel who have comparable civilian jobs, our conservative (from a military view) methodology assumes that the Army retiree is immediately employed in an equivalent civilian sector job and receives a salary equal to that of civilians already employed in that job. For those military MOS classes with no equivalent in the civilian sector (e.g., Pershing missile crewman, infantryman), three scenarios are assumed. The scenarios assume the persons are employed immediately

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after retiring and receive (a) the same income as their last year of service, (b) a 25 percent decrease, or (c) a 25 percent increase.

The Army retiree in civilian employment is assumed to receive the same savings and bonus plan compensation that is paid to civilian employees of the same age. This assumption is conservative from the military view because many civilian bonus and employee stock investment plans include factors for years of service with the company.

The Army retiree with 20 or 22 years of service is assumed to receive 60 percent of private pension amounts upon retiring from civilian employment. This is reduced to 50 percent for a 26-year military retiree. The person is assumed to fully retire at 65 and die at the national average age of 73 [6].

GENERAL CIVILIAN CAREER ASSUMPTIONS

Comparable civilian career occupations for the selected MOS classes are obtained from the Army's **Enlisted Career Management Fields and Military Occupational Specialties** publication [7]. The appropriate Dictionary of Occupational Titles classification codes obtained for each MOS are cross referenced with the **Occupational Outlook Handbook** [8].

The **Handbook** earnings per 'equivalent' civilian occupation are updated to 1983 dollars. In some cases further investigation with industry and union personnel and additional literature review was needed to accurately project earnings streams. For example, union personnel generally start at 50 percent to 60 percent of journeyman's pay and gradually achieve journeyman's pay over several years. Management personnel are assumed to receive a 10 percent wage increment after 10 years of service. Using the same procedure, Army MOS classes with no equivalent civilian jobs were compared with

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bus driver and police jobs. These jobs are used to compare compensation because military personnel have the skills necessary to obtain these civilian jobs.

Jobs that are generally unionized are assumed to receive the national average pay increase of 7.4 percent a year [9]. Nonunion jobs are assumed to increase by 7 percent [1].

Savings and bonus compensation are assumed to be 1.3 percent of yearly civilian pay. This percentage equals the 1966-1977 average compensation for private savings and thrift plans and nonproduction bonuses [2].

Private retirement income is assumed to be 37 percent of the last working year pay. This percentage is the target distribution amount of private pension plan benefits as a percentage of final salary [5].

Assumptions of social security compensation, retirement age, and death age are the same for civilians as for Army personnel.

COMPARISON METHODOLOGY

For military careers with comparable civilian jobs, the following methodology is used. The present value of income earned in military service (including retirement) is computed and added to the present value of income earned by the enlisted personnel and warrant officers in their (post-military) civilian careers. The total Army/civilian compensation is subtracted from total civilian compensation to obtain the career differentials. **Thus, negative (positive) numbers cited in the discussion and tables indicate the amount Army compensation falls below (above) equivalent civilian compensation.**

For military careers that have no comparable civilian job, a different methodology is used. Army/civilian compensation is computed under the assumption that, in civilian employment, Army retirees maintained 75, 100, or 125 percent of the

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pay they received in their last year of service. The present value of this income stream is subtracted from civilian bus driver and policy officer income streams.

A 10 percent discount rate is used in this study. This rate is the mean of both the 20-year average of annual long-term U.S. Government bond interest rates (7 percent), and the highest yearly average rate for long-term government bonds (13 percent in 1982). Additionally, in the first half of 1983, U.S. Government long-term bond rates generally varied between 10 percent and 11 percent. For the interested reader the appendixes provide comparisons at 7, 10, and 13 percent discount rates.

A study of other benefits such as medical care and insurance has been conducted [10]. Because the differences in these benefits received by Army and civilian employees were not appreciable, they are not included in the present effort.

Table 1 summarizes the general methodology used in this study.

CONSERVATIVE ASSUMPTIONS

The methodology used in this study has several conservative assumptions (from the Army point of view) which are summarized in Table 2; the assumptions help to ensure unbiased results.

III. DISCUSSION AND RESULTS

This section is divided into three parts. The first contains a detailed analysis of warrant officer/civilian careers; the second, an analysis of selected enlisted MOS classes that have directly comparable civilian jobs; and the third, a discussion of noncomparable MOS classes. The MOS classes considered for each part are shown in Table 3. Some MOS classifications are 'capped' and personnel cannot attain the rank of E9. Instead, persons in these classes are awarded another MOS. For example, a cavalry scout (MOS 19D) can achieve a top grade of E7; he then becomes an armor senior sergeant (MOS 19Z) and can

Table 1. General Methodology for Computing Compensation

- **STEP #1** <u>CALCULATING PRESENT VALUE OF PAY</u>

    BMC PER RANK X LENGTH OF TIME IN RANK X PATC OR UNION FACTOR X
    PRESENT VALUE FACTOR = PRESENT VALUE OF PAY

- **STEP #2** <u>CALCULATING COMMISSARY AND EXCHANGE COMPENSATION</u>

    BMC X 10 PERCENT X 23 CENTS X PRESENT VALUE FACTOR = PRESENT
    VALUE OF COMMISSARY AND EXCHANGE COMPENSATION

- **STEP #3** <u>BONUS CALCULATION</u>

    BONUS INCOME PER 1983 AVERAGES X PRESENT VALUE FACTOR =
    PRESENT VALUE OF BONUS

- **STEP #4** <u>CALCULATING RETIREMENT COMPENSATION</u>

    BASE PAY AT RETIREMENT AGE X (.50, .55, OR .65) X 1.06 X PRESENT
    VALUE FACTOR = PRESENT VALUE OF RETIREMENT INCOME

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Table 1. General Methodology for Computing Compensation (Cont'd)

- **STEP # 5   CALCULATING TOTAL MILITARY COMPENSATION**

   PRESENT VALUE OF BASE PAY + PRESENT VALUE OF COMMISSARY AND EXCHANGE INCOME + PRESENT VALUE OF BONUS + PRESENT VALUE OF RETIREMENT INCOME = PRESENT VALUE OF MILITARY COMPENSATION

- **STEP # 6   CALCULATING TOTAL CIVILIAN COMPENSATION**

   PRESENT VALUE OF WAGES + PRESENT VALUE OF SAVING AND BONUS PLANS (1.3 PERCENT OF WAGES) + PRESENT VALUE OF RETIREMENT INCOME (37 PERCENT OF LAST YEARS SALARY) = PRESENT VALUE OF CIVILIAN COMPENSATION

- **STEP # 7   DETERMINE ARMY RETIREE PAY FOR TIME OF CIVILIAN EMPLOYMENT**

   TOTAL CIVILIAN PRESENT VALUE OF WAGES AND BONUS/SAVINGS PAY - PRESENT VALUE OF CIVILIAN WAGES AND BONUS/SAVINGS PAY UP TO ARMY RETIREMENT AGE + PRESENT VALUE OF CIVILIAN RETIREMENT PAY X .50 OR .60 = PRESENT VALUE OF ARMY RETIREE PAY IN CIVILIAN SECTOR

Table 2. Conservative Assumptions Used In This Research

1. The analysis includes only income that is received directly in cash or indirectly as a monetary saving. The study **does not** include intangible income of services performed for the household (fixing the family car, housecleaning, home repair, etc.).

2. The study does not include 'psychic' income losses of military personnel such as frequent moves and extended periods away from the family.

3. The study assumes the military retiree will immediately be employed in an *equivalent civilian job with an income* equal to that of other civilians in the same job (assuming the same level of experience). In many cases, this cannot be valid since union rules, practices, etc. would not allow the person to assume the civilian job immediately, if at at all. No period of unemployment or part-time work is assumed.

4. In some civilian occupations, personnel generally have 'second jobs' that provide significant income. This additional income is not included in this study.

5. Military personnel who attain the rank of E9 have significant managerial responsibilities. The equivalent civilian job in most cases does not assume any 10 percent wage increase management increment to the income stream.

Table 3. MOS Classification and Comparable Civilian Job

MOS CLASSIFICATION	ARMY TITLE	MINIMUM/ MAXIMUM RANK	COMPARABLE CIVILIAN JOB TITLE
A. WARRANT OFFICERS			
150 A	ATC Technician		Senior Level Computer Repairer/Supervisor
630 A	Automotive Repair		Automotive Mechanic with Equivalent Managerial Increases
B. ENLISTED PERSONNEL WITH COMPARABLE CIVILIAN JOB			
34K	IBM 360 Repairer	E1-E7	Computer Service Technician
34Z (34K)	ADP Maintenance Supervisor (IBM 360 Repairer)	E8-E9 E1-E7	Computer Service
51M (51Z)	Firefighter (General Construction Supervisor)	E1-E7 E8-E9	Firefighter
51K (51H, 51Z)	Plumber (Construction Supervisor) (General Construction Supervisor)	E1-E5 E6-E7 E8-E9	Plumber

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Table 3. MOS Classification and Comparable Civilian Job (Continued)

MOS CLASSIFICATION	ARMY TITLE	MINIMUM/ MAXIMUM RANK	COMPARABLE CIVILIAN JOB TITLE
51R (51H, 51Z)	Interior Electrician (Construction Supervisor) (General Construction Supervisor)	E1-E5 E6-E7 E8-E9	Maintenance Electrician/ Construction Electrician
61B (61Z)	Watercraft Operator (Marine Senior Sergeant)	E1-E7 E8-E9	Merchant Marine Officers (Third to First Mate)
63B (63Z)	Light Wheeled Vehicle and Power Generator Mechanic (Mechanical Maintenance Supervisor)	E1-E7 E8-E9	Automotive Mechanic
63W (63H, 63Z)	Wheeled Vehicle Repairer (Track Vehicle Repairer) (Mechanical Maintenance Supervisor)	E1-E5 E6-E7 E8-E9	Automotive Mechanic
35H (32H)	Calibration Specialist (Communication Electronics Maintenance Chief)	E1-E7 E8-E9	Computer Service Technician
36E (31Z)	Cable Splicer (Communications-Electronics Operations Chief)	E1-E6 E7-E9	Line Installers and Cable Splicer

C. ENLISTED PERSONNEL WITH NONCOMPARABLE CIVILIAN JOB

11B	Infantryman	E1-E9	None

Table 3. MOS Classification and Comparable Civilian Job (Continued)

MOS CLASSIFICATION	ARMY TITLE	MINIMUM/ MAXIMUM RANK	COMPARABLE CIVILIAN JOB TITLE
13B (13Y, 13Z)	Cannon Crewman	E1-E7	None
	(Cannon/Missile Senior Sergeant)	E8	None
	(FA Senior Sergeant)	E9	None
19D (19Z)	Cavalry Scout	E1-E7	None
	(Armor Senior Sergeant)	E8-E9	None
19K (19Z)	M1 Armor Crewman	E1-E7	None
	(Armor Senior Sergeant)	E8-E9	None
13M (15D, 13Y, 13Z)	MLRS Crew Member	E1-E5	None
	(Lance Crewmember/MLRS Sergeant	E6-E7	None
	(Cannon/Missile Senior Sergeant	E8	None
	(FA Senior Sergeant)	E9	None
15E (13Y, 13Z)	Pershing Missile Crew Member	E1-E7	None
	(Cannon/Missile Senior Sergeant)	E8	None
	(FA Senior Sergeant)	E9	None
16D (16Z)	Hawk Missile Crewman	E1-E7	None
	(ADA Senior Sergeant)	E8-E9	
11H (11B)	Heavy Anti-Armor Weapon Infantryman	E1-E7	None
	(Infantryman)	E8-E9	None

serve 26 years to an E9. The classifications in parentheses in Table 3 indicate the new title and MOSs awarded after reaching a MOS 'cap.' The IBM repairer (MOS 34K) and ADP maintenance supervisor (MOS 34Z) are analyzed as special cases and are explained further in the discussion and results section.

WARRANT OFFICER COMPARISON

The equivalent of the warrant officer ATC technician is assumed to start as a civilian computer technician trainee and become a senior level technician with a salary equal to the 1983 national average. The civilian pay is assumed to increase at 7.4 percent to account for the projected increase in demand for computer technicians. The automotive mechanic warrant officer is assumed to work the same hours and earn the same wage as the national civilian average. Private sector mechanics are assumed to be unionized. Two civilian sector options for the mechanic are studied. Option A assumes an average mechanic who is promoted to management in the ninth year of employment. The mechanic is assumed to receive 'management increments' equal to the percentage increments given an Army warrant officer for changing grades. For example, the individual becomes a warrant officer 1 (W1) at year 9, W2 at 12, W3 at 16, and W4 at 21 years. The civilian equivalent mechanic is assumed to receive the same percentage increases in pay in years 9, 12, 16, and 21. Option B assumes an average mechanic who receives a 10 percent management increment in the eleventh year of employment.

Table 4 shows that the present value of the ATC technician income stream from enlistment to death is 8 to 9 percent less than the civilian equivalent. Note, the text provides analyses based on a 10 percent discount rate since this rate is assumed to be a mean. If the reader is interested in the differences at 7 and 13 percent discount rates, see Appendix A which provides these comparisons. As expected, the 7 percent rate generally diminishes the difference and, in some cases, provides positive percentages,

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TABLE 4. ATC Technician Warrant Officer Comparison with Civilian Equivalent

PRESENT VALUE IN THOUSANDS OF 1983 DOLLARS

Years In Service	Army Pay	Civilian Pay In Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference Difference ÷ Army Pay)
20	432	484	916	992	-76	-8
22	473	438	911	992	-81	-8
26	549	351	900	992	-92	-9

A minus sign means the Army is behind.

while the 13 percent rate generally increases the differences. Appendixes B and C compare enlisted personnel at 7, 10, and 13 percent with the same results.

Table 5 shows that Army retirement is 23 to 28 percent of total Army compensation. Thus, the present Army retirement program is an important factor in bringing the present value of income streams of Army warrant officers and their civilian equivalents into parity. Tables 6 and 7 show that the Army mechanic MOS and civilian equivalent income streams are within 11 percentage points (-4 percent to +7 percent). Note that the more highly skilled and demanded ATC officer does not keep up with a civilian counterpart, while the less demanded mechanic maintains a higher degree of comparability.

ENLISTED PERSONNEL WITH COMPARABLE CIVILIAN JOBS

Three options for Army/civilian "comparable" careers (retirement at 20, 22, and 26 years of service) are considered. For this research an Army career is defined as the total 20, 22, or 26 years which, as noted earlier, may mean several MOS changes. In the following discussion, the first MOS title identifies the career path. For example, firefighter (MOS 51M) is used to designate a person who progresses from E1 to E7 as MOS 51M and to E8 and E9 as a general construction supervisor (MOS 51Z). Due to promotion characteristics and assumptions about the comparable civilian career, the IBM repairer (MOS 34K), is analyzed only for the 20-and 22-year scenarios. For the same reasons, the ADP maintenance supervisor is analyzed only for the 26-year scenario. Each of the ten comparable civilian jobs assumes the national average compensation for 1983, and union (7.4 percent) or nonunion (7.0 percent) wage increases. Table 8 summarizes the results of this set of MOSs. For a more detailed explanation of each MOS, see Appendix B.1.

Table 8 shows that, for all jobs in this classification, the income streams of Army personnel at retirement (after 20, 22, or 26 years of service) are significantly

TABLE 5. ARMY RETIREMENT COMPENSATION AS A PERCENTAGE

OF TOTAL ARMY COMPENSATION

Years of Service	Army Warrant Officer Retirement Pay	All Army Compensation	Army Retirement Pay As A Percent of Total Army Compensation
20	121	432	28
22	124	473	26
26	127	549	23

TABLE 6. AUTOMOTIVE REPAIR COMPARISON: OPTION 1

PRESENT VALUE IN THOUSANDS OF 1983 DOLLARS

Years In Service	Army Pay	Civilian Pay In Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Army Pay)
20	432	518	950	962	-12	-1
22	473	469	942	962	-20	-2
26	549	376	925	962	-37	-4

A minus sign means the Army is behind.

TABLE 7. AUTOMOTIVE REPAIR COMPARISON: OPTION 2

PRESENT VALUE IN THOUSANDS OF 1983 DOLLARS

Years In Service	Army Pay	Civilian Pay In Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Army Pay)
20	432	364	796	764	+32	+4
22	473	330	803	764	+39	+5
26	549	265	814	764	+50	+7

A minus means the Army is behind.

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TABLE 8. SUMMARY OF LIFETIME INCOME STREAMS OF ENLISTED PERSONS
MILITARY VERSUS CIVILIAN CAREERS

| | | Percent Difference | | | | | |
| | | At Death | | | At Army Retirement | | |
MOS	Title	20 YR	22 YR	26 YR	20 YR	22 YR	26 YR
34K	IBM 360 Repairer	-9	-10	--	-33	-33	--
34Z	ADP Maintenance Supervisor	--	--	-11	--	--	-34
51M	Firefighter	+1	+2	+7	-18	-17	-12
51K	Plumber	-7	-8	-5	-31	-31	-27
51R	Interior Electrician	-8	-8	-5	-31	-31	-27
61B	Watercraft Operator	1	0	+2	-18	-19	-18
63B	Light-Wheeled Mechanic	-2	-2	+2	-23	-22	-18
63W	Wheeled Vehicle Repairer	-2	-2	+3	-22	-22	-18
35H	Calibration Specialist	-9	-10	-7	-34	-34	-25
36E	Cable Splicer	-5	-6	-2	-28	-28	-24

A minus signs means the Army is behind.

behind those of their civilian equivalents. The difference ranges from a high of 34 percent (ADP maintenance supervisor) to a low of 12 percent (firefighter). Appendix Table B.2 summarizes the comparisons for 7, 10, and 13 percent discount rates. At death, the differences are significantly lower. The ADP supervisors are then only 11 percent below their civilian equivalents and the firefighters, light-wheeled mechanics, and watercraft operators slightly above their civilian counterparts. The income streams of civilian firefighters and watercraft operators may be understated due to the conservative assumptions used (e.g., many firefighters spend 24 hours on duty, and 48 hours off duty during the "off hours," and a significant number work second jobs, which are not included in the firefighter income stream). If these were taken into account, the Army-civilian income differential would be even larger. In most cases, the differences between civilian and Army/civilian income streams are reduced by 10-20 percent from the date of military retirement to death. This reduction is due to the benefits of the current military retirement program. Table 9 shows that military retirement accounts for 21-22 percent of total military compensation. Appendix Table B.3 shows the comparison at 7, 10, and 13 percent discount rates. Thus, the military retirement program is the major compensating factor for bringing Army compensation within the range of that for equivalent civilians. Table 8 shows that longer military service (and thus higher military retirement pay) narrows the gap between civilian and military income (e.g., the difference for plumbers is 7 percent for a 20-year service retiree, but 5 percent for a 26-year retiree). Table 8 also shows that military personnel with more technical and highly demanded civilian jobs (such as MOS classes for computer technicians, plumbers, and electricians) are not compensated as well as their civilian counterparts. Generally, these skilled workers are to 5 to 10 percent behind their civilian counterparts. The incomes of the less highly skilled MOS classes are roughly equivalent to those of similar civilian jobs. But analysis of all classes shows the

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TABLE 9. MILITARY RETIREMENT AS A PERCENTAGE OF TOTAL MILITARY COMPENSATION

Years In Service	Military Retirement Compensation	All Military Compensation (Excluding Bonuses)	Military Retirement As A Percent Of All Military Compensation
20	78	368	21
22	84	399	21
26	110	489	22

importance of the current Army retirement system as a factor in maintaining the fragile balance between Army/civilian and civilian income streams. It is important to note that if more liberal assumptions were used, the Army/civilian income streams would be **significantly** less than those of their civilian equivalents.

COMPARISON OF ARMY MOS CLASSES WITH NO CIVILIAN EQUIVALENT WITH SELECTED CIVILIAN OCCUPATIONS

Military/civilian income streams for MOS classes with noncomparable civilian jobs were computed on the assumption that the military retiree would take a civilian job that would provide retirement benefits comparable to military retirement benefits plus civilian compensation equal to 75, 100, or 125 percent compensation received during the last year in service. These figures are used to establish a 'likely' total Army/civilian career income stream. The 'standard of living' approach (assuming a post-military-retirement standard of living that is 75, 100, or 125 percent of that pre-retirement standard) does not require a direct comparison with a civilian job. This method was used because little data exist on either the civilian income or jobs that military personnel actually obtain in retirement. Income streams for union and non-union bus drivers and police officers were computed and compared for the Pershing missile crewman (highest-paid noncomparable MOS) and cannon crewman (lowest-paid noncomparable MOS). The jobs of bus driver and police officer were chosen because they require skills that are generally related to those acquired in the military. Table 10 summarizes the income stream by standard of living scenario from enlistment to death, assuming military retirement at 20, 22, and 26 years of service. The table also summarizes the police and bus driver income streams. Appendix Table C.1 summarizes these income streams at 7, 10, and 13 percent discount rates. The bus driver generally has a larger income stream than the Army/civilian who maintains a 100 percent post-retirement standard for living.

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TABLE 10. PRESENT VLAUE OF NONCOMPARABLE MOS CLASSES

BUS DRIVERS AND POLICE OFFICERS

(IN THOUSANDS OF 1983 DOLLARS)

MOS	Title	Years Of Service	Post Requirement Standard Of Living		
			75%	100%	125%
13B	Cannon Crewman	20	476	539	603
16D	Hawk Missile Crewman	22	486	544	602
11H	Heavy Anti-Armor Weapon Infantryman	26	592	657	722
11B	Infantryman	20	480	543	607
19D	Calvary Scout				
		22	490	548	606
		26	596	661	726
19K	M1 Armor Crewman	20	483	546	610
		22	493	551	609
		26	599	664	729
13M	MLRS Crewman	20	481	544	608
		22	491	549	607
		26	597	662	727
15E	Pershing Missile Crewman	20	489	552	616
		22	499	557	615
		26	605	670	735
Bus Driver - Nonunion		--	---	652	---
Bus Driver - Union		--	---	701	---
Policeman - Union		--	---	619	---
Policeman - Nonunion		--	---	576	---

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In all cases (75, 100, or 125 percent) the income streams of the bus driver are greater than those of persons who retire at 20 or 22 years of service. The difference is generally between $50,000 and $100,000. For the 75 and 100 percent cases, the police officer's income is larger than that of the military person who retires at 20 or 22 years of service. Only in the 125 percent case is the military retiree income stream greater than or roughly equivalent to that of the police officer.

Equality for the military person in comparison with a bus driver is generally achieved only if the military person retires after 26 years of service at a 125 percent standard of living. Again, many police officers have second jobs and these incomes are not included in the analysis. Table 11 shows that Pershing missile crewmen (the highest-paid MOS in this classification) can generally receive an income stream equal to or greater than that of civilian bus drivers or police officers only if they take maximum advantage of retirement compensation (26 years) and maintain a 100 or 125 percent standard of living in civilian employment. They will generally not achieve the same pay as civilian bus drivers or police officers if they retire at 20 or 22 years of service. For a more detailed analysis of the Pershing missileman at 7, 10, and 13 percent discount rates, see Appendix Table C.2. Table 12 shows the same results with slightly different percent changes for the cannon crewmen since their military pay is slightly less than that of the Pershing crewmen (due to less bonus income). Here again, military retirement benefits represent the main factor in achieving parity between civilian and military compensation. Appendix Table C.3 shows the cannon crewman comparison at 7, 10, and 13 percent discount rates.

IV. SUMMARY AND CONCLUSIONS

This research shows that under the present military retirement system, lifetime income streams of a representative selection of military occupational specialties of

TABLE 11. COMPARISON OF PERSHING CREWMAN WITH POLICEMAN AND BUS DRIVER

PRESENT VALUE PER SCENARIO

(IN THOUSANDS OF 1983 DOLLARS)

Job Title	75% Scenario			100% Scenario			125% Scenario		
	Years In Service								
	20	22	26	20	22	26	20	22	26
Bus Driver (Nonunion)	-25	-23	-7	-15	-15	+3	-6	-6	+13
Bus Driver (Union)	-3-	-29	-14	-21	-20	-4	-12	-12	+5
Policeman (Union)	-21	-19	-2	-11	-10	+8	-0	-1	+19
Policeman (Nonunion)	-15	-14	+5	-4	-3	+16	+5	+5	+28

A minus sign means the Army is behind.

TABLE 12. COMPARISON OF CANNON CREWMAN WITH POLICEMAN AND BUS DRIVER
PRESENT VALUES PER SCENARIO
(IN THOUSANDS OF 1983 DOLLARS)

	75% Scenario			100% Scenario			125% Scenario		
	Years In Service								
Job Title	20	22	26	20	22	26	20	22	26
Bus Driver (Nonunion)	-27	-25	-9	-17	-17	+1	-8	-8	+11
Bus Driver (Union)	-32	-31	-16	-23	-22	-6	-14	-14	+3
Policeman (Union)	-23	-21	-4	-13	-12	+6	-3	-3	+17
Policeman (Nonunion)	-17	-16	+3	-6	-6	+14	+5	+5	+25

A minus sign means the Army is behind.

Army warrant officers and enlisted personnel are below or, at best, equivalent to comparable civilian income streams.

The current military retirement program is a key factor in bringing the present value of Army income streams close to that of comparable civilian streams. The more highly skilled and demanded an occupation is, the further Army personnel will be behind their civilian equivalents. In most cases, the incomes of Army personnel are between 20 and 30 percent behind the incomes of comparable civilian workers at military retirement age. This differential is reduced significantly, although in most cases not eliminated, over an entire lifetime by the benefits from the present military retirement system.

The research is based on conservative assumptions from a military viewpoint, and does not account for intangible cost factors such as inconveniences of frequent moves, extended time away from home, and loss of spouse's earnings. Accounting for such factors would widen even more the military-civilian income differential.

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APPENDIX A

DETAILED TABLES FOR COMPARISON OF SELECTED WARRANT OFFICER MOS

INCOME STREAMS AND CIVILIAN EQUIVALENT INCOME STREAMS

Table A.1 Comparison of Selected Warrant Officers MOS's with Selected
Civilian Occupations at 7, 10, and 13 Percent Discount Rates

ATC Technician Warrant Officer Case

Present Value in Thousands of 1983 Dollars at 7, 10, and 13 Percent

Years of Service	Total Civilian Pay			Total Army Civilian Pay			Difference Army-Civilian			Percent Difference (Difference ÷ Civilian Pay)		
	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%
20	1972	992	581	1985	916	488	+13	-76	-93	+1%	-8%	-16%
22	1972	992	581	1992	911	483	+20	-81	-98	+1%	-8%	-17%
26	1972	992	581	1992	900	474	+20	-92	-108	+1%	-9%	-19%

Table A.1 (Cont'd)

Automotive Repair Warrant Officer Percentage Change Option

Present Value in Thousands of 1983 Dollars at 7, 10, and 13 Percent

Years of Service	Total Civilian Pay			Total Army Civilian Pay			Difference Army-Civilian			Percent Difference (Difference ÷ Civilian Pay)		
	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%
20	2018	962	545	2073	950	503	+96	-12	-42	+5%	-1%	-8%
22	2018	962	545	2074	942	496	+97	-20	-49	+5%	-2%	-9%
26	2018	962	545	2061	925	483	+84	-37	-62	+4%	-4%	-11%

Table A.1 (Cont'd)

Warrant Officer Mechanic - 10% Increment: Option 2

	Present Value in Thousands of 1983 Dollars at 7, 10, and 13 Percent											
Years of Service	Total Civilian Pay			Total Army Civilian Pay			Difference Army-Civilian			Percent Difference (Difference ÷ Civilian Pay)		
	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%
20	1506	764	453	1677	796	438	+172	+32	-15	+11%	+4%	-3%
22	1506	764	453	1705	803	439	+199	+39	-13	+13%	+5%	-3%
26	1506	764	453	1749	814	441	+243	+50	-12	+16%	+7%	-3%

APPENDIX B

DETAILED TABLES FOR COMPARISON OF SELECTED ENLISTED MOS INCOME

STREAMS AND CIVILIAN EQUIVALENT INCOME STREAMS

Table B.1 MOS 34K
IBM 360 Repairer

PRESENT VALUE OF INCOME STREAM AT ARMY RETIREMENT

				Present Value in Thousands of 1983 Dollars			
Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	402	0	402	590	-188	-32%
7%	22	449	0	449	654	-205	-31%
10%	20	293	0	293	438	-145	-33%
10%	22	318	0	318	474	-156	-33%
13%	20	220	0	220	335	-115	-34%
13%	22	234	0	234	356	-122	-34%

Table B.1 MOS 34K
IBM 360 Repairer

PRESENT VALUE OF INCOME STREAM AT DEATH

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	612	1077	1689	1756	-67	- 4%
7%	22	680	1005	1685	1756	-71	- 4%
10%	20	371	386	757	831	-74	- 9%
10%	22	402	350	752	831	-79	-10%
13%	20	251	166	417	498	-81	-16%
13%	22	266	146	412	498	-88	-18%

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Table B.1 MOS 34Z
ADP Maintenance Supervisor

PRESENT VALUE OF INCOME STREAM AT ARMY RETIREMENT

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	26	572	0	572	841	-269	-32%
10%	26	379	0	379	572	-193	-34%
13%	26	263	0	265	411	-146	-36%

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Table B.1 MOS 342
ADP Maintenance Supervisor

PRESENT VALUE OF INCOME STREAM AT DEATH

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	26	902	850	1753	1756	- 3	0%
10%	26	489	309	798	893	- 95	-11%
13%	26	303	121	424	530	-106	-20%

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Table B.1 MOS 51M
Firefighter

PRESENT VALUE OF INCOME STREAM AT ARMY RETIREMENT

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	399	0	399	471	-72	-15%
7%	22	446	0	446	523	-77	-15%
7%	26	572	0	572	626	-54	- 9%
10%	20	290	0	290	352	-62	-18%
10%	22	315	0	315	380	-65	-17%
10%	26	379	0	379	433	-54	-12%
13%	20	217	0	217	270	-53	-20%
13%	22	231	0	231	287	-56	-20%
13%	26	263	0	263	313	-50	-16%

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Table B.1 MOS 51M
Firefighter

PRESENT VALUE OF INCOME STREAM AT DEATH

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	610	783	1393	1308	+ 85	+ 6%
7%	22	678	731	1409	1308	+102	+ 8%
7%	26	902	619	1521	1308	+214	+16%
10%	20	368	307	675	667	+ 8	+ 1%
10%	22	399	279	678	667	+11	+ 2%
10%	26	489	224	713	667	+46	+ 7%
13%	20	249	132	381	400	-19	- 5%
13%	22	264	116	381	400	-20	- 5%
13%	26	303	89	392	400	- 8	- 2%

Table B.1 MOS 51K
Plumber

PRESENT VALUE OF INCOME STREAM AT ARMY RETIREMENT

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	399	0	399	564	-165	-29%
7%	22	446	0	446	626	-180	-29%
7%	26	572	0	572	753	-181	-24%
10%	20	290	0	290	418	-128	-31%
10%	22	315	0	315	454	-139	-31%
10%	26	379	0	379	518	-139	-27%
13%	20	217	0	217	320	-103	-32%
13%	22	231	0	231	340	-109	-32%
13%	26	263	0	263	373	-110	-29%

Table R.1 MOS 51K
Plumber

PRESENT VALUE OF INCOME STREAM AT DEATH

			Present Value in Thousands of 1983 Dollars				
Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	610	936	1546	1551	- 4	0%
7%	22	678	874	1552	1551	+ 1	0%
7%	26	902	740	1642	1551	+92	+ 6%
10%	20	368	369	737	795	-58	- 7%
10%	22	399	334	733	795	-62	- 8%
10%	26	489	268	757	795	-38	- 5%
13%	20	249	159	408	476	-69	-14%
13%	22	265	139	404	476	-73	-15%
13%	26	303	106	409	476	-67	-14%

Table B.1 MOS 51R
Interior Electrician

PRESENT VALUE OF INCOME STREAM AT ARMY RETIREMENT

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	399	0	399	568	-169	-30%
7%	22	446	0	446	631	-185	-29%
7%	26	572	0	572	759	-187	-25%
10%	20	290	0	290	421	-131	-31%
10%	22	315	0	315	457	-142	-31%
10%	26	379	0	379	522	-143	-27%
13%	20	217	0	217	323	-106	-33%
13%	22	231	0	231	342	-111	-32%
13%	26	263	0	263	376	-113	-30%

Table B.1 MOS 51R
Interior Electrician

PRESENT VALUE OF INCOME STREAM AT DEATH

				Present Value in Thousands of 1983 Dollars			
Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	610	943	1553	1562	+ 9	+ 1%
7%	22	678	880	1558	1562	+ 4	+ 0%
7%	26	902	745	1647	1562	+85	+ 5%
10%	20	368	372	740	801	-61	- 8%
10%	22	399	337	736	801	-65	- 8%
10%	26	489	271	760	801	-41	- 5%
13%	20	249	160	409	480	-71	-15%
13%	22	264	140	404	480	-75	-16%
13%	26	303	106	410	480	-70	-15%

Table B.1 MOS 61B
Watercraft Operator

PRESENT VALUE OF INCOME STREAM AT ARMY RETIREMENT

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	407	0	407	481	- 74	-15%
7%	22	453	0	453	543	- 90	-17%
7%	26	579	0	579	688	-109	-16%
10%	20	297	0	297	362	- 65	-18%
10%	22	322	0	322	396	- 74	-19%
10%	26	386	0	386	469	- 83	-18%
13%	20	223	0	223	280	- 57	-20%
13%	22	237	0	237	300	- 63	-21%
13%	26	269	0	269	338	- 69	-20%

Table B.1 MOS 61B
Watercraft Operator

PRESENT VALUE OF INCOME STREAM AT DEATH

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	618	1063	1681	1599	+ 82	+ 5%
7%	22	686	1002	1688	1599	+ 89	+ 6%
7%	26	910	848	1758	1599	+159	+10%
10%	20	375	417	792	787	+ 5	+ 1%
10%	22	406	382	789	787	- 2	0%
10%	26	496	307	803	787	+16	+ 2%
13%	20	255	178	433	456	-23	- 5%
13%	22	269	159	428	456	-28	- 6%
13%	26	308	120	428	456	-28	- 6%

Table 8.1 MOS 63B
Light-Wheeled Mechanic

PRESENT VALUE OF INCOME STREAM AT DEATH

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
			Present Value in Thousands of 1983 Dollars				
7%	20	610	840	1450	1392	+ 58	+ 4%
7%	22	678	784	1462	1392	+ 69	+ 5%
7%	26	902	664	1566	1392	+174	+13%
10%	20	368	331	699	713	− 14	− 2%
10%	22	399	300	699	713	− 14	− 2%
10%	26	489	241	730	713	+ 17	+ 2%
13%	20	249	143	392	427	− 35	− 8%
13%	22	264	126	390	427	− 37	− 9%
13%	26	303	95	399	427	− 28	− 7%

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Table B.1 MOS 63B
Light-Wheeled Mechanic

PRESENT VALUE OF INCOME STREAM AT ARMY RETIREMENT

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	399	0	399	505	-106	-21%
7%	22	446	0	446	561	-115	-20%
7%	26	572	0	572	675	-103	-15%
10%	20	290	0	290	375	-85	-23%
10%	22	315	0	315	406	-91	-22%
10%	26	379	0	379	464	-85	-18%
13%	20	217	0	217	288	-71	-25%
13%	22	231	0	231	305	-74	-24%
13%	26	263	0	263	334	-71	-21%

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Table B.1 MOS 63W
Wheeled Vehicled Repairer

PRESENT VALUE OF INCOME STREAM AT DEATH

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	613	840	1453	1392	+ 61	+ 4%
7%	22	681	784	1465	1392	+ 73	+ 5%
7%	26	905	664	1569	1392	+177	+13%
10%	20	371	331	702	713	- 11	- 2%
10%	22	402	300	702	713	- 11	- 2%
10%	26	491	241	732	713	+ 19	+ 3%
13%	20	251	143	394	427	- 33	- 8%
13%	22	266	126	392	427	- 35	- 8%
13%	26	305	95	400	427	- 27	- 6%

Table B.1 MOS 63W
Wheeled Vehicle Repairer

PRESENT VALUE OF INCOME STREAM AT ARMY RETIREMENT

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	402	0	402	505	-103	-20%
7%	22	449	0	449	561	-112	-20%
7%	26	575	0	575	675	-100	-15%
10%	20	293	0	293	375	- 82	-22%
10%	22	318	0	318	406	- 88	-22%
10%	26	382	0	382	464	- 82	-18%
13%	20	220	0	220	288	- 68	-24%
13%	22	233	0	233	305	- 72	-24%
13%	26	265	0	265	334	- 69	-21%

Table B.1 MOS 35H
Calibration Specialist

PRESENT VALUE OF INCOME STREAM AT DEATH

				Present Value in Thousands of 1983 Dollars			
Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	610	979	1589	1620	-31	- 2%
7%	22	678	914	1592	1620	-28	- 2%
7%	26	902	774	1676	1620	+56	+ 3%
10%	20	368	386	754	831	-77	- 9%
10%	22	399	350	749	831	-82	-10%
10%	26	489	280	769	831	-62	- 7%
13%	20	249	166	415	498	-83	-17%
13%	22	264	146	410	498	-88	-18%
13%	26	303	110	413	498	-85	-17%

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Table R.1 MOS 35H
Calibration Specialist

PRESENT VALUE OF INCOME STREAM AT ARMY RETIREMENT

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	399	0	399	590	-191	-32%
7%	22	446	0	446	654	-208	-32%
7%	26	572	0	572	787	-215	-27%
10%	20	290	0	290	438	-148	-34%
10%	22	315	0	315	474	-159	-34%
10%	26	379	0	379	508	-129	-25%
13%	20	217	0	217	335	-118	-35%
13%	22	231	0	231	355	-124	-35%
13%	26	263	0	263	390	-127	-33%

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Table R.1 MOS 36E
Cable Splicer

PRESENT VALUE OF INCOME STREAM AT DEATH

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	610	928	1538	1520	- 18	- 1%
7%	22	678	866	1544	1520	+ 24	+ 2%
7%	26	902	733	1635	1520	+115	+ 8%
10%	20	368	365	734	774	- 40	- 5%
10%	22	399	331	730	774	- 44	- 6%
10%	26	489	266	756	776	- 19	- 2%
13%	20	249	157	406	461	- 55	-12%
13%	22	264	138	402	461	- 59	-13%
13%	26	303	105	408	461	- 53	-11%

Table B.1 MOS 36E
Cable Splicer

PRESENT VALUE OF INCOME STREAM AT ARMY RETIREMENT

Present Value in Thousands of 1983 Dollars

Discount Rate	Years in Service	Army Pay	Civilian Pay in Post Army Years	Total Civilian/ Army Pay	Civilian Person's Pay	Difference (Army-Civilian)	Percentage Difference (Difference ÷ Civilian Pay)
7%	20	399	0	399	542	-143	-26%
7%	22	446	0	446	604	-158	-26%
7%	26	572	0	572	729	-157	-22%
10%	20	290	0	290	401	-111	-28%
10%	22	315	0	315	436	-121	-28%
10%	26	379	0	379	500	-121	-24%
13%	20	217	0	217	307	- 90	-29%
13%	22	231	0	231	326	- 95	-29%
13%	26	263	0	263	359	- 96	-27%

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Table B.2 Summary Table Comparable Classifications

| | | | Percent Difference | | | | | |
| | | | At Death | | | At Army Retirement | | |
MOS	Title	Discount Rate	20 Yr.	22 Yr.	26 Yr.	20 Yr.	22 Yr.	26 Yr.
34K	IBM 360 Repairer	7	- 2%	- 2%	--	-32%	-31%	--
		10	- 9%	-10%	--	-33%	-33%	--
		13	-17%	-18%	--	-34%	-34%	--
34Z	ADP Maintenance Supervisor	7	--	--	- 0%	--	--	-32%
		10	--	--	-11%	--	--	-34%
		13	--	--	-20%	--	--	-36%
51M	Firefighter	7	+ 6%	+ 8%	+16%	-15%	-15%	- 9%
		10	+ 1%	+ 2%	+ 7%	-18%	-17%	-12%
		13	- 5%	- 5%	- 2%	-20%	-20%	-16%
51K	Plumber	7	0%	0%	+ 6%	-29%	-29%	-24%
		10	- 7%	- 8%	- 5%	-31%	-31%	-27%
		13	-14%	-15%	-14%	-32%	-32%	-29%
51R	Interior Electrician	7	+ 1%	0%	+ 5%	-30%	-29%	-25%
		10	- 8%	- 8%	- 5%	+ 1%	0%	+ 2%
		13	-15%	-16%	-15%	-33%	-32%	-30%
61B	Watercraft Operator	7	+ 5%	+ 6%	+10%	-15%	-17%	-16%
		10	+ 1%	0%	+ 2%	-18%	-19%	-18%
		13	- 5%	- 6%	- 6%	-20%	-21%	-20%
63B	Light-Wheeled Mechanic	7	+ 4%	+ 5%	+13%	-21%	-20%	-15%
		10	- 2%	- 2%	+ 2%	-23%	-22%	-18%
		13	- 8%	- 9%	- 7%	-25%	-24%	-21%
63W	Wheeled Vehicle Repairer	7	+ 4%	+ 5%	+13%	-20%	-20%	-15%
		10	- 2%	- 2%	+ 3%	-22%	-22%	-18%
		13	- 8%	- 6%	- 6%	-24%	-24%	-21%
35H	Calibration Specialist	7	- 2%	- 2%	+ 3%	-32%	-32%	-27%
		10	- 9%	-10%	- 7%	-34%	-34%	-25%
		13	-17%	-18%	-17%	-35%	-35%	-33%
36E	Cable Splicer	7	- 1%	+ 2%	+ 8%	-26%	-26%	-22%
		10	- 5%	- 6%	- 2%	-28%	-28%	-24%
		13	-12%	-13%	-11%	-29%	-29%	-27%

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Table B.3 Military Retirement as a Percentage
of Total Military Compensation

Discount Rate	Years in Service	Military Retirement Compensation	All Military Compensation (excluding bonuses)	Military Retirement As a Percent of All Military Compensation
7%	20	212	610	35%
7%	22	231	678	34%
7%	26	330	902	37%
10%	20	78	368	21%
10%	22	84	399	21%
10%	26	110	489	22%
13%	20	33	249	13%
13%	22	34	264	13%
13%	26	40	303	13%

APPENDIX C

DETAILED TABLES FOR COMPARISON OF PERSHING MISSILE CREWMEN

AND CANNON CREWMEN WITH BUS DRIVERS AND POLICE OFFICERS

Table C.1 Present Value of Noncomparale MOS Classes, Bus, and
Policeman Jobs at 7, 10, and 13 Percent Discount Rates

MOS	Title	Years of Service	75%			100%			125%		
			7%	10%	13%	7%	10%	13%	7%	10%	13%
13B	Cannon Crewman	20	924	476	302	1084	538	343	1245	603	357
16D	Hawk Missle Crewman	22	943	486	306	1092	544	330	1241	602	353
11H	Heavy Anti-Armor Weapon Infantryman	26	1187	592	329	1365	657	368	1543	722	393
	Infantryman, Calvary Scout	20	929	480	480	1089	543	543	1250	607	361
		22	948	490	490	1097	548	548	1246	606	357
		26	1193	596	596	1370	661	661	1548	726	397
	M1 Armor Crewman	20	933	483	482	1093	546	545	1254	610	364
		22	952	493	492	2001	551	550	1250	609	350
		26	1196	599	598	1374	664	663	1552	729	399
	MLRS Crewman	20	930	481	307	1090	544	348	1251	608	362
		22	949	491	311	1098	549	335	1247	607	358
		26	1193	597	334	1371	662	373	1549	727	398
	Pershing Missile Crewman	20	940	489	312	1100	552	353	1261	616	367
		22	959	499	316	1108	557	340	1257	615	363
		26	1203	605	339	1381	670	378	1559	735	403
	Bus-Driver - (Non-Union)	--	--	--	--	1250	652	396	--	--	--
	Bus-Driver - (Union)	--	--	--	--	1369	701	420	--	--	--
	Policeman - (Union)	--	--	--	--	1202	619	374	--	--	--
	Policeman - (Non-Union)	--	--	--	--	1098	576	353	--	--	--

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Table C.2 Comparison of Pershing Missile Crewman and Selected Occupations
Given 75, 100, and 125 Percent Living Standard at Retirement
Using 7, 10, and 13 Percent Discount Rates

75 PERCENT CASE

	Difference									Percentage Change								
	20			22			26			20			22			26		
	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%
Bus Driver – (Non-Union)	-310	-163	-84	-291	-153	-80	-47	-47	-57	-25	-25	-21	-23	-23	-20	-4	-7	-14
Bus Driver – (Union)	-429	-211	-108	-410	-201	-104	-166	-96	-81	-31	-30	-26	-29	-29	-25	-12	-14	-19
Policeman – (Union)	-262	-130	-62	-243	-120	-58	+1	-14	-35	-20	-21	-16	-20	-19	-19	+0	-2	-9
Policeman – (Non-Union)	-158	-87	-41	-139	-77	-37	+105	+29	-14	-16	-15	-12	-13	-14	-10	+10	+5	-4

Table C.2 (Cont'd)

100 PERCENT CASE

	Difference									Percentage Change								
	20			22			26			20			22			26		
	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%
Bus Driver – (Non-Union)	-150	-100	-43	-142	-95	-56	+131	+18	-18	-12	-15	-11	-11	-15	-14	+10	+3	-5
Bus Driver – (Union)	-269	-149	-67	-261	-144	-80	+12	-31	-42	-20	-21	-16	-19	-20	-19	+1	-4	-10
Policeman – (Union)	-102	-67	-21	-94	-62	-34	+179	+51	+4	-8	-11	-6	-8	-10	-9	+15	+8	+1
Policeman – (Non-Union)	2	-24	+0	+10	-19	-13	+283	+94	+25	+0	-4	+0	+1	-3	-4	+26	+16	+7

Table C.2 (Cont'd)

125 PERCENT CASE

	Difference									Percentage Change								
	20			22			26			20			22			26		
	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%
Bus Driver - (Non-Union)	+11	-36	-29	+7	-37	-33	+309	+83	+7	+1	-6	-7	+1	-6	-8	+24	+13	+2
Bus Driver - (Union)	-108	-85	-53	-112	-86	-57	+190	+34	-17	-8	-12	-13	-8	-12	-14	+14	+5	-4
Policeman - (Union)	+59	-3	-7	+55	-4	-11	+357	+116	+29	+5	+0	-2	+5	-1	-3	+30	+19	+8
Policeman - (Non-Union)	+163	+40	+14	+159	+39	+10	+461	+159	+50	+15	+5	+4	+14	+5	+3	+42	+28	+14

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Table C.3 Comparison of Cannon Crewman and Selected Occupations
Given 75, 100, and 125 Percent Living Standard at Retirement
Using 7, 10, and 13 Percent Discount Rates

75 PERCENT CASE

	Difference									Percentage Change								
	20			22			26			20			22			26		
	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%
Bus Driver – (Non-Union)	-326	-176	-94	-307	-166	-90	-63	-60	-67	-26	-27	-24	-25	-25	-23	-5	-9	-17
Bus Driver – (Union)	-445	-225	-118	-426	-215	-114	-182	-109	-91	-32	-32	-28	-31	-31	-27	-13	-16	-22
Policeman – (Union)	-278	-143	-72	-259	-133	-68	-15	-27	-45	-23	-23	-19	-22	-21	-18	-1	-4	-12
Policeman – (Union)	-174	-100	-51	-155	-90	-47	+89	+16	-24	-16	-17	-14	-16	-14	-13	+8	+3	-7

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Table C.3 (Cont'd)

100 PERCENT CASE

	Difference									Percentage Change								
	20			22			26			20			22			26		
	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%
Bus Driver – (Non-Union)	-166	-113	-53	-158	-108	-66	+115	+5	-28	-13	-17	-17	-13	-17	-17	+9	+1	-7
Bus Driver – (Union)	-285	-162	-77	-277	-157	-90	-4	-44	-52	-21	-23	-18	-20	-22	-21	0	-6	-12
Policemen – (Union)	-118	-80	-31	-110	-75	-44	+163	+39	-6	-6	-10	-13	-9	-12	-12	+14	+6	-2
Policemen – (Non-Union)	-14	-37	-10	-6	-32	-23	+267	+81	+15	-3	-6	-1	-7	0	-6	+24	+14	+4

Table C.3 (Cont'd)

125 PERCENT

	Difference									Percentage Change								
	20			22			26			20			22			26		
	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%	7%	10%	13%
Bus Driver – (Non-Union)	-5	-49	-39	-9	-50	-43	+293	+70	-3	0	-8	-10	-1	-8	-11	+23	+11	0
Bus Driver – (Union)	-124	-98	-63	-128	-99	-67	+174	+21	-27	-9	-14	-15	-9	-14	-16	+13	+3	-6
Policeman – (Union)	+43	-16	-17	+39	-17	-21	+341	+103	+19	4	-3	-5	+3	-3	-6	+28	+17	+5
Policeman – (Non-Union)	+147	+27	+4	+143	+26	+0	+445	+146	+40	+13	+5	+1	+13	+5	0	+40	+25	+11